What is claimed is:

1. A communication control circuit having a physical layer circuit in conformity with IEEE Standard 1394, wherein said physical layer circuit is provided with: cable drive means for driving an IEEE 1394 cable pursuant to said IEEE Standard 1394 and receiving a signal from said cable, said cable drive means having first and second cable drive means for driving first and second twisted pair cables of said IEEE 1394 cable, said first cable drive means having first terminals for communicating with said first twisted pair cable, first driver for driving said first twisted pair cable through said first terminals, first receiver for receiving signals applied to said first terminals, and a first arbitration comparator for detecting a state of a line connected with said first terminals, the result of detection being a first arbitration control signal, and said second cable drive means having second terminals for communicating with said second twisted pair cable, a second driver for driving said second twisted pair cable through said second terminals, second receiver for receiving signals applied to said second terminals, and a second arbitration comparator for detecting a state of a line connected with said second terminals, the result of detection being a second arbitration control signal; bus arbitration means for controlling transmission and

reception of packet data to manage bus arbitration in accordance with said IEEE Standard 1394 based on said first and second arbitration control signals;

transmission means for generating a transmission strobe signal and a transmission data signal to transmit through said first and second drivers respectively under control of said bus arbitration means; and reception means for receiving outputs of said first and second receivers under control of said bus arbitration means and supplying predetermined one of said outputs of said first and second receivers as an output; and

wherein said physical layer circuit is further provided with a self-diagnosis circuit for diagnosing said physical layer circuit, said self-diagnosis circuit comprising:

a test data creation circuit for creating a test data signal and a transmission command; reference means for providing expected value data signals, said expected value data signals being signals that are expected to be caused in the case in which test data signals are subject to the same processing as in the normal operation mode of said physical layer circuit without any error; a comparison circuit for comparing output of said reference means with output of said reception means and notifying the results of the comparison; a test control circuit for providing an operation mode switching signal in

accordance with an externally supplied test control signal for commanding execution of a self-diagnostic test; an arbitration signal switching circuit that receives first and second arbitration signals, and, when said operation mode switching signal designates the test operation mode, exchanges the values of the first and second arbitration signals and supplies the result to said bus arbitration means; and selector means;

said selector means including: an output control circuit for transferring said transmission commands to said bus arbitration means when said operation mode switching signal designates the test operation mode and blocking transmission of said transmission commands to said bus arbitration means when said operation mode switching signal designates the normal operation mode; and a selection circuit for transferring said test data signal to said transmission means when said operation mode switching signal designates the self-diagnostic test mode, and blocking transmission of said test data signal when said operation mode switching signal designates the normal operation mode.

2. A communication control device as claimed in claim 1, wherein said predetermined one of said outputs is the output of said first driver which is received by said first receiver and said reference means is a data-

strobe encoding circuit for performing data-strobe encoding of said test data signal.

3. A communication control device as claimed in claim 1, wherein said predetermined one of said outputs is the output of said first driver which is received by said first receiver and said reference means is a memory that stores said test strobe signal created by said transmission means.

4. A communication control device as claimed in claim 1, wherein said arbitration signal switching circuit is provided with a first 2-1 selector and a second 2-1 selector each for selecting either a first input or a second input according to an operation mode switching signal provided by said test control circuit, said first arbitration control signal is supplied to both said first input of said first 2-1 selector and said second input of said second 2-1 selector, said second arbitration control signal is supplied to both said second input of said first 2-1 selector and said first input of said second 2-1 selector, and the outputs of said 2-1 selectors are provided to said bus arbitration means.

5. A method of self-diagnosing a physical layer

circuit configured in conformity with IEEE Standard 1394 provided with first and second drivers for driving an IEEE 1394 twisted pair cable through first and second terminals, respectively, and with first and second receivers for receiving signals applied to said first and second terminals, respectively, comprising steps of:

disjoining the IEEE 1394 twisted pair cable from communication terminals of said physical layer circuit ,

creating expected value data signals, said expected value data signals being signals that are expected to be caused in the case in which test data signals are subject to the same processing as in the normal operation mode of said physical layer circuit without any error,

creating a test strobe signal from a test data signal by DS-LINK bit level encoding,

producing a transmission test strobe signal and a transmission test data signal by adding arbitration signals to said test strobe signal and said test data signal, respectively,

transmitting said transmission test strobe signal and said transmission test data signal through said first driver and said second driver of said physical layer circuit,

creating a first arbitration control signal and a second arbitration control signal from the outputs of said first driver and said second driver by the same

processing of said arbitration signals as the corresponding processing in the normal operation mode of the physical layer circuit of interest,

processing said first arbitration control signal and said second arbitration control signal to produce a third arbitration control signal and a fourth arbitration control signal so that the line state specified by a set of said third and fourth arbitration control signals will permit, in accordance with the Specification of the IEEE 1394 Standard, predetermined one of said outputs of said first receiver and said second receiver to feedback, as a fed-back test signal, to an internal signal-reception circuit of the physical layer circuit of interest through the same signal-reception processing as in the normal operation mode of the physical layer circuit,

comparing the fed-back test signal to said expected value data signal, and

notifying the result of the comparing as a result of the self-diagnosis.

6. A method according to claim 5, wherein a set of said first arbitration control signal and said second arbitration control signal specifies a line state that prohibits the feedback of said predetermined one of said outputs, and wherein the step of processing said first arbitration control signal and said second arbitration

control signal includes a step of exchanging the values of said first arbitration control signal and said second arbitration control signal to replace said first arbitration control signal with said second arbitration control signal as said third arbitration control signal and also replace said second arbitration control signal with said first arbitration control signal as said fourth arbitration control signal.

7. A method as claimed in claim 6, wherein said first receiver and said second receiver provides, as outputs, said transmission test strobe signal and said transmission test data signal, respectively, said predetermined one of said outputs is a transmission test strobe signal, and said expected value data signal is a test strobe signal created from a test data signal by DS-LINK bit level encoding.